

REMARKS

By the foregoing Preliminary Amendment submitted with a Request for Continued Examination, Claims 7, 9, and 11 have been amended. Thus, Claims 7, 9, 11, 13, and 14 are currently pending in the application and are subject to examination. Support for these amendments can be found at least in Figures 1 and 4, and on page 8, lines 17-22 of the Specification. The Applicants submit that no new matter has been added. Prompt and favorable examination on the merits is requested.

Section 103(a) Rejections

The Office Action rejects Claims 7 and 9 under 35 U.S.C. § 103(a) as being unpatentable over Shibata et al. (JP 04-042582, hereinafter "Shibata") in view of JP (4-116162). To the extent this rejection remains applicable to the claims as currently pending, the Applicants respectfully traverse the rejection.

Claim 7, as amended, sets forth a light emitting diode comprising a pellet, a major front surface, of which where an electrode is formed, is made of a GaAsP mixed crystal, and the major front surface is a rough surface. Further, side surfaces of the pellet are rough surfaces.

Shibata merely teaches a light emitting element where the boundary between an n-GaAsP layer 52 and a Zn diffusion area 56 forms a p-n junction, and becomes a light emitting element. Recessing and projecting sections are formed at intervals of sub-micron to several microns, on a light emitting surface 58, by performing mesa etching by using photolithographic and chemical etching techniques (see Shibata, Abstract). The Office Action admits that Shibata fails to teach that the side surfaces of the pellet are roughened

on the sides (see Office Action, paragraph 3). The Office Action cites JP (4-116162) as curing these deficiencies. However, JP (4-116162) fails to teach or suggest ways to combine or modify the references to teach all the elements set forth in amended Claim 7. Specifically, JP (4-116162) fails to teach or suggest at least, "[A] GaAsP mixed crystal... characterized in that all side surfaces of the pellet are rough surfaces." The Office Action asserts that JP (4-116162) teaches the feature of an LED having a rough side surface. However, JP (4-116162) does not teach or suggest at least this feature. JP (4-116162) merely labels the portion 7 of the pellet as a "side" without teaching or disclosing side surfaces of the pellet being intentionally roughened (see JP (4-116162)).

It appears that the Office Action takes the position that the diagram on the front cover of JP (4-116162) teaches that one side of the pellet is roughened. Even assuming this were true, then based on the reference diagram, JP (4-116162) clearly teaches that only one side of the pellet is roughened. In contrast, Claim 7 sets forth that "all side surfaces of the pellet are rough surfaces." JP (4-116162) gives no suggestion or motivation that it would be advantageous to modify Shibata so that all side surfaces of the pellet are rough surfaces.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. M.P.E.P. § 2143.03. For the above reasons, Applicants submit that neither Shibata nor JP (4-116162), alone or in combination, teach or disclose all the elements of Claim 7, as amended.

Further, establishment of a *prima facie* case of obviousness also requires that the some suggestion or motivation to combine the reference teachings be shown. M.P.E.P.

§ 2143. The Federal Circuit has produced a number of decisions overturning obviousness rejections due to a lack of suggestion in the prior art of the desirability of combining references. M.P.E.P. § 2145 X. The Office Action asserts that "it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Shibata to include the side surfaces, as taught by JP (4-116162), so as to increase the light emitting surfaces." However, JP (4-116162) does not teach or suggest that a pellet having side surfaces necessarily increases light emitting surfaces. Additionally, neither Shibata nor JP (4-116162) teaches or suggests the inclusion of light emitting surfaces on side surfaces of a pellet. Thus, even if modifying Shibata to include such side surfaces were possible (not admitted), an increase in light emitting surfaces would not necessarily have been the result.

Additionally, the Federal Circuit has held that it is improper to combine references where the references teach away from their combination. M.P.E.P. § 2145 (X)(D)(2). When considering a prior art reference, that reference must be considered in its entirety, including portions that would lead away from the claimed invention. M.P.E.P. § 2141 VI. Shibata discloses a light emitting array, not a light emitting pellet (see Shibata, col. 2, lines 54-56). An essential feature of a light emitting diode array structure is that the neighboring light emitting diodes contained within the array do not interfere with each other. Therefore, it is necessary to prevent the leakage of light from the light emitting diodes that comprise the array structure in the horizontal direction. Thus, not only is it not obvious to combine the teachings of Shibata and JP (4-116162), Shibata teaches away from any feature that would "increase the light emitting surfaces" as the Office Action suggests (see Office Action, page 3, line 4).

Therefore, there is no basis for the combination of Shibata and JP (4-116162), for at least the reasons that the combination would not necessarily result in an increase in the light emitting surfaces, as asserted by the Office Action, and because the references teach away from such a combination. Thus, Applicants respectfully submit that no teaching, suggestion or proper motivation has been shown to combine the teachings of Shibata and JP (4-116162).

Thus, the Examiner has failed to establish *prima facie* obviousness at least because the references do not teach or suggest all the elements of the claimed invention, and because the Examiner has not presented sufficient motivation to combine the references. For at least these reasons, the Applicants respectfully request reconsideration and withdrawal of the rejection of Claim 7 under 35 U.S.C. § 103(a).

Claim 9 depends from independent Claim 7. Therefore, as Claim 7 is allowable over the cited prior art, Applicants submit that Claim 9, which depends from allowable Claim 7, is likewise allowable over the cited prior art.

The Office Action also rejects Claims 11, 13, and 14 under 35 U.S.C. § 103(a) as being unpatentable over Shibata in view of Nishiwaki et al. (JP 59085858 A, hereinafter "Nishiwaki"). To the extent this rejection remains applicable to the claims as currently pending, the Applicants respectfully traverse this rejection.

Claim 11, as amended, recites at least the feature of "the pellet is treated with an etching solution of an aqueous solution containing Br₂, nitric acid, hydrofluoric acid, and acetic acid, or I₂, nitric acid, hydrofluoric acid, and acetic acid to form fine projections on at least the major front surface and all side surfaces of the pellet."

Neither Shibata nor Nishiwaki, alone or in combination, teach or suggest at least this feature of amended Claim 11. As the Office Action admits, Shibata fails to teach or suggest treating the pellet with an etching solution to form fine projections on at least the major front surface and all side surfaces of the pellet. The Office Action cites Nishiwaki as curing this deficiency. However, Nishiwaki fails to teach or suggest at least this element of amended claim 11.

Nishiwaki merely teaches an etching agent using an aqueous solution of bromine water and nitric acid (see Nishiwaki, Abstract). Nowhere does Nishiwaki teach or suggest using the etching agent to form "fine projections on the major front surface and all side surfaces of the pellet," as set forth in amended Claim 11. Further, nowhere does Nishiwaki suggest ways to modify the reference to teach all the elements of amended Claim 11. Nishiwaki only teaches the preparation of the etching agent, and its usefulness in etching InP and InGaAsP semiconductor material. Nishiwaki patterns the film used for etching "as in the prior art" (see Nishiwaki, Abstract).

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. M.P.E.P. § 2143.03. Neither Shibata nor Nishiwaki, alone or in combination, teach or suggest all the features of the invention of Claim 11. For at least this reason, the Applicants respectfully request that the rejection of Claim 11 under 35 U.S.C. § 103(a) be withdrawn.

Claims 13 and 14 depend from independent Claim 11. Therefore, as Claim 11 is allowable over the cited prior art, Applicants submit that Claims 13 and 14, which depend from allowable Claim 11, are likewise allowable over the cited prior art.

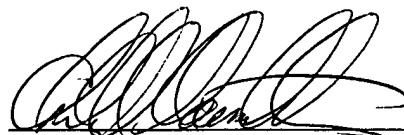
Conclusion

Applicants respectfully submit that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below to schedule a personal or telephone interview to discuss any remaining issues.

In the event that this paper is not considered to be timely filed, an appropriate extension of time is requested. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account Number 01-2300, referencing Docket Number 107242-00005.

Respectfully submitted,

Arent Fox PLLC



George E. Oram, Jr.
Attorney for the Applicants
Registration Number 27,931

25,895

Customer Number 004372
ARENT FOX PLLC
1050 Connecticut Avenue, NW
Suite 400
Washington, DC 20036-5339
Telephone: 202-857-6000
Fax: 202-638-4810

GEO/SCO:vmh